

**Water Body Fact Sheets for 2002  
Section 303(d) List Update  
Lahontan Region**

***EAST AND WEST WALKER RIVER  
HYDROLOGIC UNITS***

**California Regional Water Quality Control Board, Lahontan Region  
2501 Lake Tahoe Boulevard  
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**November 2001**

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Note: This packet contains water body-specific fact sheets for ten water body/pollutant combinations in the East Walker River watershed. Two additional water bodies in the West Walker River watershed, Hot Creek and Fales Hot Springs, are proposed for delisting. See the entries for these water bodies in the summary fact sheet for “Nine Naturally Impaired Waters.”

## **Notes on Numerical Water Quality Objectives for Nitrogen and Phosphorus in the East Walker River Watershed**

This group of fact sheets summarizes the rationale for recommendations that the East Walker River and some of its tributaries be placed on the Section 303(d) list for nitrogen and/or phosphorus. The numerical water quality objectives for the East Walker River watershed, in Table 3-15 on page 3-42 of the 1995 *Water Quality Control Plan for the Lahontan Region* (Basin Plan), need clarification. The Basin Plan has two sets of numerical objectives for the East Walker River watershed, one for the “East Walker River at Bridgeport” and the other for “Robinson Creek and all tributaries above Bridgeport Valley.” The objectives for tributaries above Bridgeport Valley are more stringent than those for the East Walker at Bridgeport. Both sets of objectives date from the 1975 *Water Quality Control Plan for the North Lahontan Basin*, which was superseded by the 1995 Basin Plan. Objectives for the East Walker River were apparently based on water quality data collected at the U.S. Geological Survey gaging station downstream of Bridgeport Reservoir, and they apply to waters both upstream and downstream of this station.

The boundaries of “Bridgeport Valley,” as used in the second set of objectives, apparently coincide with those of Hydrologic Subunit 630.30. The major tributary streams originate near the Sierra Nevada crest within Hydrologic Subunit 630.40. Thus the more stringent water quality objectives apply to the upstream reaches of the tributary streams, and the less stringent objectives for the East Walker River apply to tributary reaches within Bridgeport Valley. Numerical objectives based on high concentrations of nutrients released from eutrophic Bridgeport Reservoir are not necessarily appropriate for protection of beneficial uses for either reach of the East Walker River (upstream and downstream of Bridgeport Reservoir) or for the lower reaches of tributary streams. (The narrative water quality objective for “nondegradation” precludes lowering of water quality in waters with better quality than that required by standards, unless specific findings can be made.)

Most of the current water quality objectives for the East Walker River and its tributaries are set at levels higher than the U.S. Environmental Protection Agency (USEPA’s) recommended nutrient criteria for rivers and streams of the “Mountainous West” nutrient ecoregion which includes the Sierra Nevada. (A table summarizing these criteria is available at:

<http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/sumtable.pdf>.)

The USEPA’s recommended numbers are 0.12 milligrams per liter (mg/L) for total nitrogen, and 0.01 mg/L for total phosphorus, both expressed as annual medians. The Lahontan Regional Board is participating in a statewide process that could result in development of more specific Sierra Nevada nutrient criteria. Water quality objectives for the East Walker River watershed should be updated when resources are available and set at levels which will ensure protection of all beneficial uses.

**EAST WALKER RIVER ABOVE BRIDGEPORT RESERVOIR, PATHOGENS**  
**Section 2002 303(d) Fact Sheet**  
**Listing**

**Summary of Proposed Action**

The segment of the East Walker River upstream of Bridgeport Reservoir is proposed to be listed for “pathogens” as a result of violations of the narrative water quality objective for fecal coliform bacteria. Fecal coliform bacteria in water are indicators of contamination from the feces of warm-blooded animals, and of the possible presence of many different kinds of pathogenic microorganisms.

**Table 1. 303(d) Listing/TMDL Information**

<b>Waterbody Name</b>	East Walker River	<b>Pollutant(s)</b>	Pathogens
<b>Hydrologic Unit</b>	East Walker River (630.30)	<b>Sources</b>	Livestock, stormwater, wildlife
<b>Total Length</b>	~18 miles	<b>TMDL Priority</b>	Medium
<b>Size Affected</b>	~10 miles	<b>TMDL End Date</b>	After 2015
<b>Latitude/Longitude</b>	38 °15' 20" N, 119° 13' 30" W	<b>Original 303(d) Listing Year</b>	2002

**Watershed Characteristics**

The East Walker River, in Mono County, originates in the Hunewill Hills, east of the Sierra Nevada crest, and flows about 10 miles through Bridgeport Valley above Bridgeport Reservoir. Other streams tributary to the East Fork or directly to Bridgeport Reservoir are Virginia, Green, Robinson, Buckeye, and Swauger Creeks. The headwaters of these creeks, which include a number of small lakes, are within the Hoover Wilderness. Upper and Lower Twin Lakes are the largest natural lakes in the watershed. The river flows through the town of Bridgeport before entering Bridgeport Reservoir near U.S. Geological Survey station No.10290200. The reservoir is about 5 miles long. The segment of the East Fork below Bridgeport Reservoir, about eight miles long, is joined by several smaller tributaries coming from the Sweetwater Mountains to the north and the Bodie Hills to the South. The East and West Walker Rivers join in Nevada to form the Walker River which has its terminus in Walker Lake. There are extensive wetlands in Bridgeport Valley that are used for livestock grazing. Bridgeport Reservoir is eutrophic, and TMDLs for nitrogen and phosphorus are currently under development.

**Water Quality Objectives Not Attained**

The narrative water quality objective for fecal coliform bacteria in the Lahontan Basin Plan states:

*“Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.*

*The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml.”*

## **East Walker River above Bridgeport Reservoir, Pathogens 2002 Section 303(d) Fact Sheet, Page 2**

The units used in the water quality objective are the numbers of bacterial colonies per 100 milliliters (ml), sometimes referred to as the “Most Probable Number” or MPN.

This objective applies to all surface waters of the Lahontan Region. Because the current U.S. Geological Survey (USGS) monitoring program for bacteria in the East Walker River watershed involves monthly sampling, the 40/100 ml limit in the last part of the objective was the criterion used in assessment for update of the Section 303(d) list.

The Lahontan Basin Plan does not currently include water quality objectives for fecal streptococci. However, these bacteria are also indicators of fecal pollution and, therefore, of impairment. Fecal streptococci can be used to assess sources of contamination. If the ratio of fecal coliform numbers to fecal streptococcus numbers is greater than 4, a human source is generally indicated. A ratio of less than 0.7 indicates non-human (animal) sources.

### **Evidence of Impairment**

The results of bacterial sampling by the U.S. Geological Survey at Station 10290200, above Bridgeport Reservoir, are shown in Table 2. At least eight of seventeen fecal coliform samples exceeded the 40/100 ml limit in the narrative water quality objective. According to USGS staff, the “K” code indicates that the bacteria count was outside the acceptable range or ideal count. An ideal count for fecal coliform is 20-60 colonies plate. For fecal streptococcus the ideal count is 20-100 per plate. Table 2 shows that high bacterial counts at both stations coincide with months when livestock are present in the upper East Walker River watershed.

**Table 2. Monitoring data for bacteria in the East Walker River  
above Bridgeport Reservoir (colonies per 100 ml)**

<b>Sampling Date</b>	<b>Fecal coliform</b>	<b>Fecal streptococci</b>
04-12-00	K3	34
05-10-00	82	200
06-07-00	K360	300
06-07-00	K270	250
06-07-00	270	280
07-11-00	170	76
08-08-00	130	54
09-12-00	93	K22
10-11-00	210	58
11-13-00	K10	K32
12-11-00	K4	K2
01-11-01	K3	15
02-13-01	K2	=
03-12-01	K2	60
04-10-01	8	-
05-09-01	63	59
06-05-01	170	240

## **East Walker River above Bridgeport Reservoir, Pathogens 2002 Section 303(d) Fact Sheet, Page 3**

### **Extent of Impairment**

The entire segment of the East Walker River above Bridgeport Reservoir is recommended for listing.

### **Potential Sources**

Inspection of the relative numbers of fecal coliform and fecal streptococcus in Table 2 indicates that fecal contamination is from animal sources. Livestock wastes are probably the major source of fecal bacteria. There may be some contribution of bacteria from pet wastes in stormwater from Bridgeport; however, the highest numbers of bacteria are found during the summer, when there is relatively little precipitation. Other possible sources include birds, wildlife, and human recreational users of the watershed.

### **TMDL Priority**

This TMDL is recommended for medium priority, with completion projected to occur after 2015. Problems with bacteria from livestock wastes will be addressed to some extent through the development and implementation of nutrient TMDLs for Bridgeport Reservoir, and through implementation of agricultural Best Management Practices under the Regional Board's nonpoint source program. Monitoring by Regional Board staff in the Lake Tahoe Basin shows that management practices that restrict livestock access to surface waters lead to significant reductions in numbers of fecal coliform bacteria.

### **Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region's Section 303(d) List of Impaired Surface Water Bodies*.

Menon, A.S., 2001. *Shellfish Safety: Bacterial Indicators on [sic] Shellfish Water Quality*. Canadian Shellfish Quality Resource. Available on the Internet:  
<<http://www.shellfishquality.ca/indicators.htm>>.

Honeywell, P.D., 2001. Email from Paul Honeywell, U.S. Geological Survey to Kim Gorman of Regional Board staff, dated 3/13/01 "Re: Bridgeport Data." Email explains error codes.

U.S. Geological Survey, 2001. Unpublished water quality data.

**EAST WALKER RIVER BELOW BRIDGEPORT RESERVOIR, NITROGEN**  
**2002 Section 303(d) Fact Sheet**  
**Listing**

**Summary of Proposed Action**

The segment of the East Walker River between the Bridgeport Reservoir outlet and the California-Nevada State line is proposed to be listed for violation of the water quality objective for total nitrogen. (This segment of the East Walker River is currently Section 303(d) listed for sediment and metals. Delisting for metals is being recommended.)

**Table 1. 303(d) Listing/TMDL Information**

<b>Waterbody Name</b>	East Walker River	<b>Pollutant(s)</b>	Nitrogen
<b>Hydrologic Unit</b>	East Walker River (630.10)	<b>Sources</b>	Reservoir releases, stormwater, erosion
<b>Total Length</b>	~18 miles	<b>TMDL Priority</b>	High
<b>Size Affected</b>	~8 miles	<b>TMDL End Date</b>	After 2015
<b>Latitude/Longitude</b>	38°19'40" N, 119°12'50" W	<b>Original 303(d) Listing Year</b>	2002

**Watershed Characteristics**

The East Walker River, in Mono County, originates in the Hunewill Hills, east of the Sierra Nevada crest, and flows about 12 miles through Bridgeport Valley above Bridgeport Reservoir. Other streams tributary to the East Fork or directly to Bridgeport Reservoir are Virginia, Green, Robinson, Buckeye, and Swauger Creeks. The headwaters of these creeks, which include a number of small lakes, are within the Hoover Wilderness. Upper and Lower Twin Lakes are the largest natural lakes in the watershed. The river flows through the town of Bridgeport before entering Bridgeport Reservoir. The reservoir is about 5 miles long. The segment of the East Fork below Bridgeport reservoir, about eight miles long, is joined by several smaller tributaries coming from the Sweetwater Mountains to the north and the Bodie Hills to the South. The East and West Walker Rivers join in Nevada to form the Walker River, which has its terminus in Walker Lake. Extensive wetlands in Bridgeport Valley are used for livestock grazing. Bridgeport Reservoir is eutrophic, and TMDLs for nitrogen and phosphorus are currently under development. The segment of the river below Bridgeport Reservoir is a trophy trout fishery, and lands adjoining this segment have been acquired by the California Department of Fish and Game. This reach of the river flows parallel to State Highway 182 and is probably affected by stormwater runoff from the highway.

**Water Quality Objectives Not Attained**

The numerical water quality objectives for total nitrogen in the East Walker River are 0.50 milligrams per liter (mg/L) as an annual mean and 0.80 mg/L as a 90<sup>th</sup> percentile level. (Objectives expressed as 90<sup>th</sup> percentiles mean that only 10 % of all samples are allowed to be higher than the stated number.)

## **East Walker River Below Bridgeport Reservoir, Nitrogen 2002 Section 303(d) Fact Sheet, Page 2**

### **Evidence of Impairment**

The mean total nitrogen concentration for nine samples collected by the U.S. Geological Survey at the gaging station below Bridgeport Reservoir was 0.64 mg/L, exceeding the annual mean objective. The range of total nitrogen concentrations was 0.109-1.32 mg/L. Three of nine samples (33%) exceeded the 90<sup>th</sup> percentile limit.

In the 1999 North Mono County Resource Conservation District (RCD) study, the mean concentration of total nitrogen for eight samples collected below the reservoir was 0.75 mg/L, with a range of 0.1 to 2.2. Four of these samples (50%) exceeded the 90<sup>th</sup> percentile value.

The mean total nitrogen concentration for seven samples collected by the Nevada Division of Environmental Protection at its East Walker River “Stateline” station between March 1997 and November 1998 was 0.72 mg/L; concentrations ranged from 0.46 to 1.19 mg/L. The “Stateline” station is actually in California about four miles upstream from the state line.

### **Extent of Impairment**

The segment of the East Walker River below Bridgeport Reservoir and above the California – Nevada State Line is recommended to be listed for nitrogen.

### **Potential Sources**

Releases from Bridgeport Reservoir are the major sources of nutrient loading to the lower East Walker River in California. Some additional nutrient loading presumably comes from tributary streams (Murphy Creek, Fryingpan Creek, and other unnamed streams), stormwater runoff from Highway 182, atmospheric deposition, and nonpoint sources such as range livestock grazing.

### **TMDL Priority**

This TMDL is recommended for a high priority. Nutrient loading from Bridgeport Reservoir to the lower segment of the East Walker River will be addressed during development of TMDLs for the reservoir. If a more specific TMDL is needed for the lower river, it will be completed after 2015. Regional Board staff may consider developing separate sets of water quality objectives for the segments of the East Walker River upstream and downstream of Bridgeport Reservoir.

### **Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

**East Walker River Below Bridgeport Reservoir, Nitrogen  
2002 Section 303(d) Fact Sheet, Page 3**

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region's Section 303(d) List of Impaired Surface Water Bodies*.

Nevada Division of Environmental Protection, Bureau of Water Quality Planning. State of Nevada Surface Water Monitoring Network, Walker River Basin, 1997-98 data for East Fork at Stateline. Available on the Internet: [http://ndep.state.nv.us/bwqp/mon\\_w5.htm](http://ndep.state.nv.us/bwqp/mon_w5.htm).

North Mono County Resource Conservation District, 2000. *Report on the Upper Walker River Water Quality Study, 1999*.

U.S. Geological Survey, 2001. Unpublished water quality data provided via FTP.



**EAST WALKER RIVER BELOW BRIDGEPORT RESERVOIR, PHOSPHORUS**  
**2002 303(d) Fact Sheet**  
**Listing**

**Summary of Proposed Action**

The segment of the East Walker River between eutrophic Bridgeport Reservoir and the California-Nevada state line is proposed to be listed for violation of the water quality objective for total phosphorus. This segment of the East Walker River is currently listed for sediment and metals. Delisting for metals is being recommended.

**Table 1. 303(d) Listing/TMDL Information**

<b>Waterbody Name</b>	East Walker River	<b>Pollutant(s)</b>	Phosphorus
<b>Hydrologic Unit</b>	East Walker River (630.10)	<b>Sources</b>	Reservoir releases, stormwater, erosion
<b>Total Length</b>	~18 miles	<b>TMDL Priority</b>	High
<b>Size Affected</b>	~8 miles	<b>TMDL End Date</b>	After 2015
<b>Latitude/Longitude</b>	38°19'40" N, 119°12'50" W	<b>Original 303(d) Listing Year</b>	2002

**Watershed Characteristics**

The East Walker River, in Mono County, originates in the Hunewill Hills, east of the Sierra Nevada crest, and flows about 12 miles through Bridgeport Valley above Bridgeport Reservoir. Other streams tributary to the East Fork or directly to Bridgeport Reservoir are Virginia, Green, Robinson, Buckeye, and Swauger Creeks. The headwaters of these creeks, which include a number of small lakes, are within the Hoover Wilderness. Upper and Lower Twin Lakes are the largest natural lakes in the watershed. The segment of the East Fork below Bridgeport reservoir, about eight miles long, is joined by several smaller tributaries coming from the Sweetwater Mountains to the north and the Bodie Hills to the South. Some streams (e.g., Bodie and Rough Creeks) flow eastward from the Bodie Hills and Sweetwater Mountains and join the East Walker River in Nevada. The East and West Walker Rivers join in Nevada to form the Walker River, which has its terminus in Walker Lake. There are extensive wetlands in Bridgeport Valley that are used for livestock grazing. Bridgeport Reservoir is eutrophic, and TMDLs for nitrogen and phosphorus are currently under development. The segment of the river below Bridgeport Reservoir is a trophy trout fishery, and lands adjoining this segment have been acquired by the California Department of Fish and Game. This reach of the river flows parallel to State Highway 182 and is probably affected by stormwater runoff from the highway.

**Water Quality Objectives Not Attained**

The numerical water quality objectives for total phosphorus in the East Walker River are 0.06 milligrams per liter (mg/L) as an annual mean and 0.10 mg/L as a 90<sup>th</sup> percentile level. (Objectives expressed as 90<sup>th</sup> percentiles mean that only 10 % of all samples are allowed to be higher than the stated number.)

## **East Walker River Below Bridgeport Reservoir, Phosphorus 2002 Section 303(d) Fact Sheet, Page 2**

### **Evidence of Impairment**

The mean concentration of total phosphorus in eleven samples collected by the U.S. Geological Survey (USGS) at the gaging station below the reservoir between April 2000 and February 2001 was 0.083 mg/L. The mean annual concentration in nine USGS samples for 2000 was 0.094 mg/L. Four of the nine samples collected in 2000 exceeded the 90<sup>th</sup> percentile value.

### **Extent of Impairment**

The reach of the East Walker River between Bridgeport Reservoir and the California-Nevada State line is recommended for listing.

### **Potential Sources**

Releases from Bridgeport Reservoir are the major sources of nutrient loading to the lower East Walker River in California. Some additional nutrient loading presumably comes from tributary streams (Murphy Creek, Fryingpan Creek, and other unnamed streams), stormwater runoff from Highway 182, atmospheric deposition, and nonpoint sources such as range livestock grazing.

### **TMDL Priority**

This TMDL is recommended for a high priority. Nutrient loading from Bridgeport Reservoir to the lower segment of the East Walker River will be addressed during development of TMDLs for the reservoir. If a more specific TMDL is needed for the lower river, it will be completed after 2015.

### **Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region's Section 303(d) List of Impaired Surface Water Bodies*.

U.S. Geological Survey, 2001. Unpublished water quality data provided via FTP.

**EAST WALKER RIVER, METALS**  
**2002 Section 303(d) Fact Sheet**  
**Delisting**

**Evidence to Support Delisting**

The East Walker River in Mono County (Hydrologic Subunit Nos. 630.10 and 6.30.30) is currently Section 303(d) listed for sediment and metals. It was listed for metals based on "elevated" concentrations of metals in fish tissue samples collected in the segment of the river downstream of Bridgeport Reservoir as under the statewide Toxic Substances Monitoring Program (TSMP). During the 1997-98 Section 303(d) list update process, the State Water Resources Control Board and Regional Boards agreed that TSMP "elevated data level" statistics, calculated from statewide data involving many different fish species, should not be grounds for listing unless tissue levels exceeded human fish consumption criteria, or unless there was other evidence of impairment due to toxics. The Lahontan Regional Board recommended delisting of other water bodies listed on the basis of TSMP data during the 1997-1998 Section 303(d) list update process. The East Walker River was not included in this recommendation because of insufficient time for discussion among Regional Board staff. During the 2001-2002 list update cycle, Lahontan Regional Board staff are recommending that water bodies not be listed for TSMP data if those data are the only evidence of impairment, even if tissue levels exceed human fish consumption criteria, because TSMP sample numbers are small and not statistically representative of local fish populations.

The "elevated" TSMP results for the East Walker River were for metals in fish livers, which are not generally consumed. Liver data included detectable cadmium, copper, lead, selenium, silver, and zinc; the liver concentrations of copper, lead, silver and zinc were at levels that were considered "elevated" in the 1980s. (TSMP "elevated data levels" are the 85<sup>th</sup> and 95<sup>th</sup> percentile levels of all historic data collected statewide, and thus change from year to year.)

Table 1 summarizes TSMP data from edible fish filet tissue for metals with analytical results above detection levels. The historic mercury levels do not exceed the current "Maximum Tissue Residue Level" human consumption criterion issued by the California Office of Environmental Health Hazard Assessment (0.37 parts per million or ppm). However, they are high enough to warrant additional monitoring of mercury when resources permit. An inactive mill for

**Table 1. Toxic Substances Monitoring Program Results: Mercury and Selenium Concentrations in Fish Filet Tissue Sampled at East Walker River at Bridgeport, in parts per million (ppm)**

Sampling Date	Species	Mercury (ppm)	Selenium (ppm)
11/06/80	Brown Trout	0.09	
10/27/83	Brown Trout	0.32	
10/27/83	Brown Trout	0.15	
10/16/84	Brown Trout	0.10	
10/30/85	Brown Trout	0.22	
10/30/85	Mountain Whitefish	0.04	
10/23/86	Brown Trout	0.20	0.16
10/28/87	Sucker	0.31	0.14
10/28/87	Brown Trout	0.05	0.18
10/18/88	Brown Trout	0.12	0.14

## **East Walker River, Metals**

### **2002 Section 303(d) Fact Sheet, Page 2**

processing of mercury ore in the nearby Aurora Canyon Creek watershed is a CERCLA (Superfund) site. Aurora Canyon Creek is tributary to the East Walker River above Bridgeport Reservoir and can receive stormwater from the millsite during periods of high runoff. Mercury levels in limited soil and sediment samples downstream of the millsite exceeded some criteria used in the CERCLA assessment process. The East Walker River watershed is highly mineralized and includes inactive mines in both the Sweetwater Mountains and the Bodie Hills. Metals may enter the river naturally through erosion and stormwater from undisturbed sites or may be contributed from accelerated erosion and surface runoff as a result of human activities.

### **Watershed Characteristics**

The East Walker River, in Mono County, originates in the Hunewill Hills, east of the Sierra Nevada crest, and flows about 12 miles through Bridgeport Valley above Bridgeport Reservoir. Other streams tributary to the East Fork or directly to Bridgeport Reservoir are Virginia, Green, Robinson, Buckeye, and Swauger Creeks. The headwaters of these creeks, which include a number of small lakes, are within the Hoover Wilderness. Upper and Lower Twin Lakes are the largest natural lakes in the watershed. The segment of the East Fork below Bridgeport reservoir, about eight miles long, is joined by several smaller tributaries coming from the Sweetwater Mountains to the north and the Bodie Hills to the south. Some streams (e.g., Bodie and Rough Creeks) flow eastward from the Bodie Hills and Sweetwater Mountains and join the East Walker River in Nevada. The East and West Walker Rivers join in Nevada to form the Walker River, which has its terminus in Walker Lake.

### **Recommendation**

The East Walker River is recommended to be delisted for metals, and to be placed on a “watch list” for further monitoring and assessment.

### **Information Sources**

Brown and Root Environmental, 1996. *Draft Final Site Inspection Report, Aurora Canyon Millsite, Bakersfield District, California*. Contract No. 1422-N651-C4-3049, January 19, 1996.

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region’s Section 303(d) List of Impaired Surface Water Bodies*.

California State Water Resources Control Board, 2001. Toxic Substances Monitoring Program database printout for Walker River watershed, March 2001.

**VIRGINIA CREEK, PATHOGENS**  
**2002 Section 303(d) Fact Sheet**  
**Listing**

**Summary of Proposed Action**

Virginia Creek, a tributary of the East Walker River, is proposed to be listed for “pathogens” as a result of violations of the narrative water quality objective for fecal coliform bacteria. Fecal coliform bacteria in water are indicators of contamination from the feces of warm-blooded animals and of the possible presence of many different kinds of pathogenic microorganisms.

**Table 1. 303(d) Listing/TMDL Information**

<b>Waterbody Name</b>	Virginia Creek	<b>Pollutant(s)</b>	Pathogens
<b>Hydrologic Unit</b>	East Walker River (630.30 and 630.40)	<b>Sources</b>	Livestock, wildlife
<b>Total Length</b>	~17 miles	<b>TMDL Priority</b>	Medium
<b>Size Affected</b>	~17 miles	<b>TMDL End Date</b>	After 2015
<b>Latitude/Longitude</b>	38°11'30"N, 119°12'30"W	<b>Original 303(d) Listing Year</b>	2002

**Watershed Characteristics**

Virginia Creek, in Mono County, has headwaters in the Virginia Lakes near the Sierra Nevada crest. It flows northeast for about 8 miles to the vicinity of Conway Summit, and then flows about 9 miles north, in close proximity to Highway 395, before joining the East Walker River south of Bridgeport. Its tributaries include Dog and Clearwater Creeks. There is road access to the Virginia Lakes from the Conway Summit area. The lower watershed is used for livestock grazing.

**Water Quality Objectives Not Attained**

The narrative water quality objective for fecal coliform bacteria in the Lahontan Basin Plan states:

*“Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.*

*The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml.”*

The units used in the water quality objective are the numbers of bacterial colonies per 100 milliliters (ml), sometimes referred to as the “Most Probable Number” or MPN.

This objective applies to all surface waters of the Lahontan Region. Because the current U.S. Geological Survey (USGS) monitoring program for bacteria in the East Walker River watershed involves one monthly sample, the 40/100 ml limit in the last part of the objective was the criterion used in assessment for update of the Section 303(d) list.

The Lahontan Basin Plan does not currently include water quality objectives for fecal streptococci. However, these bacteria are also indicators of fecal pollution and therefore of impairment. Fecal

## **Virginia Creek, Pathogens**

### **2002 Section 303(d) Fact Sheet, Page 2**

streptococci can be used to assess sources of contamination. If the ratio of fecal coliform numbers to fecal streptococcus numbers is greater than 4, a human source is generally indicated, and a ratio of less than 0.7 points to animal sources.

### **Evidence of Impairment**

The results of bacterial sampling by the USGS at Virginia Creek are summarized in Table 2. At least six of fourteen fecal coliform samples exceeded the 40/100 ml limit in the narrative water quality objective. According to USGS staff, the “K” code indicates that the bacteria count was outside the acceptable range or ideal count. An ideal count for fecal coliform is 20-60 colonies per plate. For fecal streptococcus the ideal count is 20-100 colonies per plate. Table 2 shows that high bacterial counts at both stations coincide with months when livestock are present in the Virginia Creek watershed.

**Table 2. Monitoring Data for Bacteria in Virginia Creek (colonies per 100 ml)**

<b>Sampling Date</b>	<b>Fecal coliform</b>	<b>Fecal streptococci</b>
4/12/00	K7	K2
5/10/00	25	K1
6/05/00	110	K11
7/12/00	>100	50
8/09/00	68	K23
9/13/00	62	K20
10/10/00	59	K10
11/13/00	110	K8
12/13/00	39	K2
01/10/01	6	K64
02/15/01	-	K2
03/12/01	13	K2
04/11/01	1	5
05/10/01	4	28
06/06/01	7	64

### **Extent of Impairment**

Bacteria samples were collected at the USGS gage in Bridgeport Valley. Because no data are available for upstream reaches of Virginia Creek, the entire creek is recommended for listing.

### **Potential Sources**

Bacteria colony numbers for the Virginia Creek samples were smaller than those for the other East Walker River tributaries sampled, and the large number of “K” codes does not permit evaluation of fecal coliform to fecal streptococcus ratios. Livestock wastes are probably the major source of bacteria. Wildlife, septic systems, and human recreational users of the watershed are other potential sources.

**Virginia Creek, Pathogens**  
**2002 Section 303(d) Fact Sheet, Page 3**

**TMDL Priority**

This TMDL is recommended for medium priority, with completion projected to occur after 2015. Problems with bacteria from livestock wastes will be addressed to some extent through the development and implementation of nutrient TMDLs for Bridgeport Reservoir, and through implementation of agricultural Best Management Practices under the Regional Board's nonpoint source program. Monitoring by Regional Board staff in the Lake Tahoe Basin shows that management practices that restrict livestock access to surface waters lead to significant reductions in numbers of fecal coliform bacteria.

**Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region's Section 303(d) List of Impaired Surface Water Bodies*.

Honeywell, P.D., 2001. Email from Paul Honeywell of U.S. Geological Survey to Kim Gorman of Regional Board staff, dated 3/13/01, "Re: Bridgeport Data." Email explains error codes.

Menon, A.S., 2001. *Shellfish Safety: Bacterial Indicators on [sic] Shellfish Water Quality*. Canadian Shellfish Quality Resource. Available on the Internet:  
<<http://www.shellfishquality.ca/indicators.htm>> .

U.S. Geological Survey, 2001. Unpublished water quality data.

**ROBINSON CREEK, PATHOGENS**  
**2002 303(d) Fact Sheet**  
**Listing**

**Summary of Proposed Action**

The segment of Robinson Creek between Twin Lakes and Bridgeport Reservoir is proposed to be listed for “pathogens” as a result of violations of the narrative water quality objective for fecal coliform bacteria. Fecal coliform bacteria in water are indicators of contamination from the feces of warm-blooded animals, and of the possible presence of many different kinds of pathogenic microorganisms.

**Table 1. 303(d) Listing/TMDL Information**

<b>Waterbody Name</b>	Robinson Creek	<b>Pollutant(s)</b>	Pathogens
<b>Hydrologic Unit</b>	East Walker River (630.30 and 630.40)	<b>Sources</b>	Livestock, wildlife, septic systems
<b>Total Length</b>	~16 miles	<b>TMDL Priority</b>	Medium
<b>Size Affected</b>	~9 miles	<b>TMDL End Date</b>	After 2015
<b>Latitude/Longitude</b>	38°16' 23" N, 119°15' 15" W	<b>Original 303(d) Listing Year</b>	2002

**Watershed Characteristics**

Robinson Creek, in Mono County, originates near the Sierra Nevada crest. There are several small lakes and streams near its headwaters. Upper and Lower Twin Lakes are “onstream” glacial lakes which have several other tributary streams of their own, and are managed as reservoirs. Below Lower Twin Lake, Robinson Creek flows about nine miles to Bridgeport Reservoir. The upper Twin Lakes watershed includes a resort and residential development on public and private lands; there are several U.S. Forest Service campgrounds along Lower Robinson Creek. Near Bridgeport Reservoir, the creek flows through wet meadows used for livestock grazing. Bridgeport Reservoir is eutrophic and will be the subject of TMDLs for nitrogen and phosphorus.

**Water Quality Objectives Not Attained**

The narrative water quality objective for fecal coliform bacteria in the Lahontan Basin Plan states:

*“Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.*

*The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 m.”*

The units used in the water quality objective are the numbers of bacterial colonies per 100 milliliters (ml), sometimes referred to as the “Most Probable Number” or MPN.



**Robinson Creek, Pathogens**  
**2002 Section 303(d) Fact Sheet, Page 2**

This objective applies to all surface waters of the Lahontan Region. Because the current U.S. Geological Survey (USGS) monitoring program for bacteria in the East Walker River watershed involves one monthly sample, the 40/100 ml limit in the last part of the objective was the criterion used in assessment for update of the Section 303(d) list.

The Lahontan Basin Plan does not currently include water quality objectives for fecal streptococci. However, these bacteria are also indicators of fecal pollution and therefore of impairment. Fecal streptococci can be used to assess sources of contamination. If the ratio of fecal coliform numbers to fecal streptococcus numbers is greater than 4, a human source is generally indicated, and a ratio of less than 0.7 points to animal sources.

**Evidence of Impairment.**

The USGS sampled bacteria at three Robinson Creek stations in 2000 and early 2001. There was only one violation of the water quality objective for the upstream station (Robinson Creek at Twin Lakes, Station 10290500), with 47 fecal coliform colonies per 100 ml in June 2001, and one fecal streptococcus colony per 100 ml. Data for the two lower stations are summarized in Table 2. The 40/100 ml limit in the narrative water quality objective was exceeded at both stations during the summer. According to USGS staff, the "K" code indicates that the bacteria count was outside the acceptable range or ideal count. An ideal count for fecal coliform is 20-60 colonies per plate. For fecal streptococcus the ideal count is 20-100 colonies per plate. Table 2 shows that high bacterial counts at both stations coincide with months when livestock are present in the lower Robinson Creek watershed.

**Table 2. Monitoring data for bacteria in Robinson Creek (colonies per 100 ml)**

Sampling Month	Robinson Creek at Hwy 395 (Station 10291100)		Robinson Creek at Bridgeport Reservoir (Station 10291200)	
	Fecal coliform	Fecal streptococci	Fecal coliform	Fecal streptococci
April 2000	K7	130	K2	K8
May 2000	K7	61	K16	88
June 2000	K200	140	K250	130
June 2000	=	=	280	110
July 2000	450	100	>600	350
August 2000	2100	66	K50	K100
September 2000	3600	88	K670	260
October 2000	K33	K14	69	K18
November 2000	K5	K2	55	K6
December 2000	K2	K1	K5	K4
January 2001	K2	2	K2	3
February 2001	K6	-	<1	-
March 2001	K1	2	K3	59
April 2001	1	6	1	6
May 2001	47	140	50	120
June 2001	630	69	54	62

**Robinson Creek, Pathogens**  
**2002 Section 303(d) Fact Sheet, Page 3**  
**Extent of Impairment**

Because there are no recent available data on bacteria in Robinson Creek above Twin Lakes or in the reach between the Twin Lakes gaging station and Highway 395, the Reach of Robinson Creek between the Twin Lakes outlet and Bridgeport Reservoir is recommended for listing.

**Potential Sources**

Inspection of the relative numbers of fecal coliform and fecal streptococcus bacteria in Table 2 indicates that fecal contamination at the Bridgeport Reservoir station, and at the Highway 395 site in June and July 2000, was from animal sources. The high ratios in the August and September 2000, and June 2001 samples at the Highway 395 station may indicate a human source. Livestock wastes are probably the major source of fecal bacteria loading to lower Robinson Creek. Other possible sources include birds, wildlife, failing septic systems, and human recreational users of the watershed.

**TMDL Priority**

This TMDL is recommended for medium priority, with completion projected to occur after 2015. Problems with bacteria from livestock wastes will be addressed to some extent through the development and implementation of nutrient TMDLs for Bridgeport Reservoir, and through implementation of agricultural Best Management Practices under the Regional Board's nonpoint source program. Monitoring by Regional Board staff in the Lake Tahoe Basin shows that management practices that restrict livestock access to surface waters lead to significant reductions in numbers of fecal coliform bacteria.

**Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region's Section 303(d) List of Impaired Surface Water Bodies*.

Honeywell, P.D., 2001. Email from Paul Honeywell, U.S. Geological Survey to Kim Gorman of Regional Board staff, dated 3/13/01 "Re: Bridgeport Data." Email explains error codes.

Menon, A.S., 2001. *Shellfish Safety: Bacterial Indicators on [sic] Shellfish Water Quality*. Canadian Shellfish Quality Resource. Available on the Internet:  
<<http://www.shellfishquality.ca/indicators.htm>>.

U.S. Geological Survey, 2001. Unpublished water quality data provided via FTP.

**ROBINSON CREEK, HWY 395 TO BRIDGEPORT RESERVOIR, NITROGEN**  
**2002 Section 303(d) Fact Sheet**  
**Listing**

**Summary of Proposed Action**

The segment of Robinson Creek between Highway 395 and Bridgeport Reservoir is proposed for listing due to violation of the water quality objective for total nitrogen.

**Table 1. 303(d) Listing/TMDL Information**

<b>Waterbody Name</b>	Robinson Creek	<b>Pollutant(s)</b>	Nitrogen
<b>Hydrologic Unit</b>	East Walker River (630.30 and 630.40)	<b>Sources</b>	Livestock wastes, wildlife, atmospheric deposition, erosion, stormwater
<b>Total Length</b>	~16 miles	<b>TMDL Priority</b>	High
<b>Size Affected</b>	~1.5 miles	<b>TMDL End Date</b>	After 2015
<b>Latitude/Longitude</b>	38°16' 23" N, 119°15' 15" W	<b>Original 303(d) Listing Year</b>	2002

**Watershed Characteristics**

Robinson Creek, in Mono County, originates near the Sierra Nevada crest. There are several small lakes and streams near its headwaters. Upper and Lower Twin Lakes are “onstream” glacial lakes which have several other tributary streams of their own, and are managed as reservoirs. Below Lower Twin Lake, Robinson Creek flows about nine miles to Bridgeport Reservoir. The upper Twin Lakes watershed includes a resort and residential development on public and private lands; there are several U.S. Forest Service campgrounds along Lower Robinson Creek. Near Bridgeport Reservoir, the creek flows through wet meadows used for livestock grazing. Bridgeport Reservoir is eutrophic and will be the subject of TMDLs for nitrogen and phosphorus.

**Water Quality Objectives Not Attained**

The numerical water quality objectives for total nitrogen in the East Walker River and its tributaries within Bridgeport Valley are 0.50 milligrams per liter (mg/L) as an annual mean and 0.80 mg/L as a 90<sup>th</sup> percentile level. (Objectives expressed as 90<sup>th</sup> percentiles mean that only 10 % of all samples are allowed to be higher than the stated number.)

**Evidence of Impairment**

Concentrations of total nitrogen in monthly samples collected by the U.S. Geological Survey in Robinson Creek at Bridgeport Reservoir between January and June, 2001 ranged from 0.115 mg/L to 0.807. One of 6 samples (16.7%) exceeded the 90<sup>th</sup> percentile value.

**Robinson Creek, Hwy 395 to Bridgeport Reservoir, Nitrogen  
2002 Section 303(d) Fact Sheet, Page 2**

**Extent of Impairment**

The segment of Robinson Creek between Highway 395 and Bridgeport Reservoir, about 1.5 miles long, is recommended for listing.

**Potential Sources**

Livestock wastes are probably the major source of nitrogen loading to this segment of Robinson Creek. Other potential sources include wildlife, atmospheric deposition, stormwater from Highway 395, erosion, and nitrogen fixation by wetland algae and soil microorganisms.

**TMDL Priority**

This TMDL is recommended for high priority. Nitrogen loading from Robinson Creek will be addressed during development of a nitrogen TMDL for Bridgeport Reservoir. If a separate TMDL is necessary for the creek, it will be completed after 2015.

**Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region's Section 303(d) List of Impaired Surface Water Bodies*.

U.S. Geological Survey, 2001. Unpublished water quality data.

**BUCKEYE CREEK, PHOSPHORUS**  
**Section 2002 303(d) Fact Sheet**  
**Listing**

**Summary of Proposed Action**

Buckeye Creek, a tributary of Bridgeport Reservoir, is proposed to be listed for violation of the water quality objective for total phosphorus.

**Table 1. 303(d) Listing/TMDL Information**

<b>Waterbody Name</b>	Buckeye Creek	<b>Pollutant(s)</b>	Phosphorus
<b>Hydrologic Unit</b>	East Walker River (630.30 and 630.40)	<b>Sources</b>	Livestock waste, erosion, atmospheric deposition.
<b>Total Length</b>	~13 miles	<b>TMDL Priority</b>	High
<b>Size Affected</b>	~13 miles	<b>TMDL End Date</b>	After 2015
<b>Latitude/Longitude</b>	38° 15' 50" N, 119° 16' 37" W	<b>Original 303(d) Listing Year</b>	2002

**Watershed Characteristics**

Buckeye Creek, in Mono County, originates within the Hoover Wilderness near the Sierra Nevada crest and flows northeast to Bridgeport Reservoir. It has a number of tributary streams including Eagle and Swauger Creeks. Buckeye Hot Spring is located near the creek above Bridgeport Valley; there is a campground near the spring. Within Bridgeport Valley, Buckeye Creek has a braided channel and flows through wetlands that are used for livestock grazing.

**Water Quality Objectives Not Attained**

The numerical water quality objectives for total phosphorus for tributaries of the East Walker River within Bridgeport Valley are those for the river itself. These objectives are 0.06 milligrams per liter (mg/L) as an annual mean and 0.10 mg/L as a 90<sup>th</sup> percentile level. (Objectives expressed as 90<sup>th</sup> percentiles mean that only 10 % of all samples are allowed to be higher than the stated number.)

**Evidence of Impairment**

Concentrations of total phosphorus in nine samples collected by the U.S. Geological Survey (USGS) from Buckeye Creek at Highway 395 in 2000 ranged from 0.116 mg/L in April to 0.008 mg/L in November, with a mean value of 0.029. The April sample exceeded the 90<sup>th</sup> percentile objective. Concentrations of total phosphorus in six samples collected by the USGS at this station in 2001 ranged from 0.008 mg/L in January to 0.115 mg/L in May, with a mean value of 0.029. The May sample exceeded the 90<sup>th</sup> percentile objective; however, it was reported as an “estimated” value.

**Buckeye Creek, Phosphorus**  
**2002 Section 303(d) Fact Sheet, Page 2**

**Extent of Impairment**

Because additional monitoring is needed to define the extent of phosphorus problems in Buckeye Creek upstream of Bridgeport Valley, the entire creek is recommended for listing at this time.

**Potential Sources**

Phosphorus is present in soils and may reach Buckeye Creek through erosion. Other possible sources are livestock wastes, atmospheric deposition of phosphorus suspended in wood smoke (e.g., from forest fires) or road dust, and potential natural inputs from Buckeye Hot Springs.

**TMDL Priority**

This TMDL is recommended for a high priority. Phosphorus loading from Buckeye Creek will be addressed to some extent during the development of a phosphorus TMDL for Bridgeport Reservoir. A separate TMDL for the creek, if needed, will be completed after 2015.

**Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region's Section 303(d) List of Impaired Surface Water Bodies*.

Honeywell, P.D., 2001. Email from Paul Honeywell, U.S. Geological Survey to Kim Gorman of Regional Board staff, dated 3/13/01 "Re: Bridgeport Data." Email explains error codes.

U.S. Geological Survey, 2001. Unpublished water quality data provided via FTP.

**BUCKEYE CREEK, PATHOGENS**  
**Section 2002 303(d) Fact Sheet**  
**Listing**

**Summary of Proposed Action**

Buckeye Creek, a tributary of Bridgeport Reservoir, is proposed to be listed for “pathogens” as a result of violations of the narrative water quality objective for fecal coliform bacteria. Fecal coliform bacteria in water are indicators of contamination from the feces of warm-blooded animals, and of the possible presence of many different kinds of pathogenic microorganisms.

**Table 1. 303(d) Listing/TMDL Information**

<b>Waterbody Name</b>	Buckeye Creek	<b>Pollutant(s)</b>	Pathogens
<b>Hydrologic Unit</b>	East Walker River (630.30 and 630.40)	<b>Sources</b>	Livestock waste, wildlife
<b>Total Length</b>	~13 miles	<b>TMDL Priority</b>	Medium
<b>Size Affected</b>	~13 miles	<b>TMDL End Date</b>	After 2015
<b>Latitude/Longitude</b>	38°15' 50" N, 119°16' 37" W	<b>Original 303(d) Listing Year</b>	2002

**Watershed Characteristics**

Buckeye Creek, in Mono County, originates within the Hoover Wilderness near the Sierra Nevada crest and flows northeast to Bridgeport Reservoir. It has a number of tributary streams including Eagle and Swauger Creeks. Buckeye Hot Spring is located near the creek above Bridgeport Valley; there is a campground near the spring. Within Bridgeport Valley, Buckeye Creek has a braided channel and flows through wetlands that are used for livestock grazing.

**Water Quality Objectives Not Attained**

The narrative water quality objective for fecal coliform bacteria in the Lahontan Basin Plan states:

*“Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.*

*The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml.”*

The units used in the water quality objective are the numbers of bacterial colonies per 100 milliliters (ml), sometimes referred to as the “Most Probable Number” or MPN.

This objective applies to all surface waters of the Lahontan Region. Because the current U.S. Geological Survey (USGS) monitoring program for bacteria in the East Walker River watershed involves one monthly sample, the 40/100 ml limit in the last part of the objective was the criterion used in assessment for update of the Section 303 (d) list.

## **Buckeye Creek, Pathogens**

### **2002 Section 303(d) Fact Sheet, Page 2**

The Lahontan Basin Plan does not currently include water quality objectives for fecal streptococci. However, these bacteria are also indicators of fecal pollution and therefore of impairment. Fecal streptococci can be used to assess sources of contamination. If the ratio of fecal coliform numbers to fecal streptococcus numbers is greater than 4, a human source is generally indicated, and a ratio of less than 0.7 points to animal sources.

### **Evidence of Impairment**

The results of bacterial sampling by the USGS at two Buckeye Creek stations are summarized in Table 2. At least five of ten fecal coliform samples at the Highway 395 station, and at least six of 14 samples at the Bridgeport Reservoir station, exceeded the 40/100 ml limit in the narrative water quality objective. According to USGS staff, the “K” code indicates that the bacteria count was outside the acceptable range or ideal count. An ideal count for fecal coliform is 20-60 colonies per plate. For fecal streptococcus the ideal count is 20-100 colonies per plate. Table 2 shows that high bacterial counts at both stations coincide with months when livestock are present in the Buckeye Creek watershed.

**Table 2. Monitoring data for bacteria in Buckeye Creek (colonies per 100 ml)**

Sampling Month	Buckeye Creek at Hwy 395		Buckeye Creek at Bridgeport Reservoir	
	Fecal coliform	Fecal streptococci	Fecal coliform	Fecal streptococci
April 2000	-	-	K2	K4
May 2000	73	38	K13	23
June 2000	K180	120	>200	300
June 2000	-	-	>300	160
June 2000	-	-	190	120
July 2000	>600	380	>600	260
August 2000	K290	560	K55	K71
September 2000	530	K40	>600	520
October 2000	100	K58	110	52
November 2000	41	28	37	38
December 2000	K11	K2	K7	K20
January 2001	K6	4	K2	7
February 2001	K3	-	K2	-
March 2001	-	-	K1	6
April 2001	1	1	1	-
May 2001	15	58	120	120
June 2001	50	44	1600	150

There was one violation of the objective at a third station (Buckeye Creek near Bridgeport) in June 2001, with 47 fecal coliform colonies per 100 ml and 14 fecal streptococcus colonies per 100 ml.

### **Extent of Impairment**

Because impairment is evident at two stations on Buckeye Creek, and because grazing occurs in much of the watershed, the entire creek is recommended for listing.



**Buckeye Creek, Pathogens**  
**2002 Section 303(d) Fact Sheet, Page 3**

**Potential Sources**

Inspection of the relative numbers of fecal coliform and fecal streptococcus in Table 2 indicates that fecal contamination is from animal sources. Livestock wastes are probably the major source of fecal bacteria. Other possible sources include birds, wildlife, and human recreational users of the watershed.

**TMDL Priority**

This TMDL is recommended for medium priority, with completion projected to occur after 2015. Problems with bacteria from livestock wastes will be addressed to some extent through the development and implementation of nutrient TMDLs for Bridgeport Reservoir and through implementation of agricultural Best Management Practices under the Regional Board's nonpoint source program. Monitoring by Regional Board staff in the Lake Tahoe Basin shows that management practices that restrict livestock access to surface waters lead to significant reductions in numbers of fecal coliform bacteria.

**Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region's Section 303(d) List of Impaired Surface Water Bodies*.

Honeywell, P.D., 2001. Email from Paul Honeywell, U.S. Geological Survey to Kim Gorman of Regional Board staff, dated 3/13/01 "Re: Bridgeport Data." Email explains error codes.

Menon, A.S., 2001. *Shellfish Safety: Bacterial Indicators on [sic] Shellfish Water Quality. Canadian Shellfish Quality Resource*. Available on the Internet:  
<<http://www.shellfishquality.ca/indicators.htm>>.

U.S. Geological Survey, 2001. Unpublished water quality data provided via FTP.

**SWAUGER CREEK, PHOSPHORUS**  
**2002 Section 303(d) Fact Sheet**  
**Listing**

**Summary of Proposed Action**

Swauger Creek, a tributary of Buckeye Creek in the East Walker River watershed, is recommended to be listed for violation of the water quality objective for total phosphorus.

**Table 1. 303(d) Listing/TMDL Information**

<b>Waterbody Name</b>	Swauger Creek	<b>Pollutant(s)</b>	Pathogens
<b>Hydrologic Unit</b>	East Walker River (630.30 and 630.40)	<b>Sources</b>	Livestock, wildlife
<b>Total Length</b>	~13 miles	<b>TMDL Priority</b>	High
<b>Size Affected</b>	~13 miles	<b>TMDL End Date</b>	After 2015
<b>Latitude/Longitude</b>	38 °17' 00" N, 119°17'55" W	<b>Original 303(d) Listing Year</b>	2002

**Watershed Characteristics**

Swauger Creek, in Mono County, originates in the Sweetwater Mountains and flows south and southeast near Highway 395 before joining Buckeye Creek, west of Bridgeport Reservoir. It has several tributaries including Huntoon Creek, Long Valley Creek, and Harvey Creek. Livestock grazing is the main land use in the watershed.

**Water Quality Objectives Not Attained**

The numerical water quality objectives for total phosphorus for tributaries of the East Walker River within Bridgeport Valley are those for the river itself. These objectives are 0.06 milligrams per liter (mg/L) as an annual mean and 0.10 mg/L as a 90<sup>th</sup> percentile level. (Objectives expressed as 90<sup>th</sup> percentiles mean that only 10 % of all samples are allowed to be higher than the stated number.)

**Evidence of Impairment**

Concentrations of total phosphorus in nine samples collected in Swauger Creek in 2000 ranged from 0.023 to 0.107 mg/L, with a mean value of 0.068 mg/L. Concentrations of total phosphorus in six samples collected in 2001 ranged from 0.047 to .0.117 mg/L, with a mean value of 0.73 mg/L. The creek was in violation of both the annual mean and 90<sup>th</sup> percentile objectives during each of the two years of sampling.

**Extent of Impairment**

Because additional monitoring is needed to define the extent of phosphorus problems in Swauger Creek, the entire creek is recommended for listing at this time.

**Swauger Creek, Phosphorus**  
**2002 Section 303(d) Fact Sheet, Page 2**

**Potential Sources**

Phosphorus is present in soils and may reach Swauger Creek through erosion. Other possible sources are livestock wastes, stormwater from Highway 395, and atmospheric deposition of phosphorus suspended in wood smoke (e.g., from forest fires) or road dust.

**TMDL Priority**

This TMDL is recommended for a higher priority. Phosphorus loading from Swauger Creek will be addressed to some extent during the development of a phosphorus TMDL for Bridgeport Reservoir. A separate TMDL for the creek, if needed, will be completed after 2015.

**Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region's Section 303(d) List of Impaired Surface Water Bodies*.

U.S. Geological Survey, 2001. Unpublished water quality data.

**SWAUGER CREEK, PATHOGENS**  
**2002 Section 303(d) Fact Sheet**  
**Listing**

**Summary of Proposed Action**

Swauger Creek, a tributary of Buckeye Creek in the East Walker River watershed, is proposed to be listed for “pathogens” as a result of violations of the narrative water quality objective for fecal coliform bacteria. Fecal coliform bacteria in water are indicators of contamination from the feces of warm-blooded animals and of the possible presence of many different kinds of pathogenic microorganisms.

**Table 1. 303(d) Listing/TMDL Information**

<b>Waterbody Name</b>	Swauger Creek	<b>Pollutant(s)</b>	Pathogens
<b>Hydrologic Unit</b>	East Walker River (630.30 and 630.40)	<b>Sources</b>	Livestock, wildlife, septic system, human recreational users.
<b>Total Length</b>	~13 miles	<b>TMDL Priority</b>	Medium
<b>Size Affected</b>	~13 miles	<b>TMDL End Date</b>	After 2015
<b>Latitude/Longitude</b>	38 °17' 00" N, 119°17'55" W	<b>Original 303(d) Listing Year</b>	2002

**Watershed Characteristics**

Swauger Creek, in Mono County, originates in the Sweetwater Mountains and flows south and southeast near Highway 395 before joining Buckeye Creek west of Bridgeport Reservoir. It has several tributaries including Huntoon Creek, Long Valley Creek, and Harvey Creek. Livestock grazing is the main land use in the watershed.

**Water Quality Objectives Not Attained**

The narrative water quality objective for fecal coliform bacteria in the Lahontan Basin Plan states:

*“Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.*

*The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml.”*

The units used in the water quality objective are the numbers of bacterial colonies per 100 milliliters (ml), sometimes referred to as the “Most Probable Number” or MPN.

This objective applies to all surface waters of the Lahontan Region. Because the current U.S. Geological Survey (USGS) monitoring program for bacteria in the East Walker River watershed involves one monthly sample, the 40/100 ml limit in the last part of the objective was the criterion used in assessment for update of the Section 303(d) list.

## **Swauger Creek, Pathogens**

### **2002 Section 303(d) Fact Sheet, Page 2**

The Lahontan Basin Plan does not currently include water quality objectives for fecal streptococci. However, these bacteria are also indicators of fecal pollution and therefore of impairment. Fecal streptococci can be used to assess sources of contamination. If the ratio of fecal coliform numbers to fecal streptococcus numbers is greater than 4, a human source is generally indicated, and a ratio of less than 0.7 points to animal sources.

### **Evidence of Impairment**

The results of bacterial sampling by the USGS at Swauger Creek are shown in Table 2. At least five of sixteen fecal coliform samples exceeded the 40/100 ml limit in the narrative water quality objective. According to USGS staff, the “K” code indicates that the bacteria count was outside the acceptable range or ideal count. An ideal count for fecal coliform is 20-60 colonies per plate. For fecal streptococcus the ideal count is 20-100 per plate. Table 2 shows that high bacterial counts at both stations coincide with months when livestock are present in the Swauger Creek watershed.

**Table 2. Monitoring data for bacteria in Swauger Creek (colonies per 100 ml)**

<b>Sampling Date</b>	<b>Fecal Coliform</b>	<b>Fecal Streptococcus</b>
03-13-00	K2	11
04-13-00	K6	55
05-11-00	K2	K8
06-06-00	59	91
07-12-00	50	>1000
08-09-00	73	K94
09-13-00	250	310
10-12-00	K28	160
11-14-00	K8	96
12-12-00	K8	55
01-09-01	K2	88
02-14-01	K1	-
03-13-01	K1	30
04-12-01	1	16
05-09-01	3	73
06-05-01	130	330

### **Extent of Impairment**

Because data on bacteria are available for only one station, and because grazing occurs throughout the watershed, the entire length of Swauger Creek is recommended for listing.

### **Potential Sources**

Because so many of the data have “K” codes, it is difficult to compare ratios of fecal coliform to fecal streptococcus to determine possible sources for fecal bacteria at this station. The ratios point to animal sources on some sampling dates and human sources on others. Livestock wastes are probably the major source of fecal bacteria. Other possible sources include wildlife, failing septic systems, and human recreational users of the watershed.

**Swauger Creek, Pathogens**  
**2002 Section 303(d) Fact Sheet, Page 3**

**TMDL Priority**

This TMDL is recommended for medium priority, with completion projected to occur after 2015. Problems with bacteria from livestock wastes will be addressed to some extent through the development and implementation of nutrient TMDLs for Bridgeport Reservoir and through implementation of agricultural Best Management Practices under the Regional Board's nonpoint source program. Monitoring by Regional Board staff in the Lake Tahoe Basin shows that management practices that restrict livestock access to surface waters lead to significant reductions in numbers of fecal coliform bacteria.

**Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

California Regional Water Quality Control Board, Lahontan Region, 2001. *Staff Report on Recommended Changes to Lahontan Region's Section 303(d) List of Impaired Surface Water Bodies*.

Honeywell, P.D., 2001. Email from Paul Honeywell, U.S. Geological Survey to Kim Gorman of Regional Board staff, dated 3/13/01 "Re: Bridgeport Data." Email explains error codes.

Menon, A.S., 2001. *Shellfish Safety: Bacterial Indicators on [sic] Shellfish Water Quality*. Canadian Shellfish Quality Resource. Available on the Internet:  
<<http://www.shellfishquality.ca/indicators.htm>>.

U.S. Geological Survey, 2001. Unpublished water quality data.

**NINE NATURALLY IMPAIRED WATERS, SALINITY, METALS, AND ARSENIC**  
**2002 Section 303(d) Fact Sheet**  
**Delisting**

**Rationale for Delisting**

The nine water bodies listed in Tables 1 and 2 are saline or geothermal surface waters which were listed in the late 1980s or early 1990s for salinity and/or toxic trace metals. Although constituents exceed drinking water standards, all of these water bodies were given potential Municipal and Domestic Supply (MUN) beneficial use designations as a result of Basin Plan amendments which applied the MUN use to almost all waters in the Lahontan Region. The Regional Board amended its Basin Plan in 2000 to remove the MUN use, and the conflict with drinking water standards, for the waters in Table 1. These amendments have been approved by the State Board and are pending final approvals from other agencies. Regional Board staff conducted a scientific literature review and prepared a detailed Use Attainability Analysis which shows that:

- These waters meet the “Sources of Drinking Water Policy” (State Board Resolution 88-63) criteria for exclusion from the MUN use due to their poor quality, and are unlikely to be in demand as drinking water due to the relatively small amounts of water available;
- The salts and trace elements affecting these water bodies come from natural sources (volcanic, geothermal, and/or evaporative concentration in closed basins over geologic time);
- Saline and geothermal waters support unique biological communities adapted to their extreme environmental conditions, and should not be considered “impaired” in relation to freshwater aquatic life criteria. The USEPA’s (1997) guidance for the development of site specific aquatic life criteria states: *“For aquatic life uses, where the natural background concentration for a specific parameter is documented, by definition that concentration is sufficient to support the level of aquatic life expected to occur naturally at the site absent any interference by humans.”*

These waters, and other “naturally impaired” waters in the Lahontan Region, are recommended for removal from the Section 303(d) list because the salts and trace elements in question are not “pollutants” under the definition in the Clean Water Act. See the Regional Board staff report on the Section 303(d) List update for further discussion of naturally impaired waters in relation to listing.

Because of the extensive documentation already provided in the Use Attainability Analysis, separate fact sheets have not been prepared for these waters.

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2002 303(d) Fact Sheet, Page 2**

**Table 1. Naturally Impaired Waters Addressed in Lahontan Region's 2000 Basin Plan Amendments**

<b>Water Body Name</b>	<b>County</b>	<b>HU No.</b>	<b>Reason for Listing</b>
Wendel Hot Springs	Lassen	637.20	Metals
Amedee Hot Springs	Lassen	637.20	Metals
Hot Creek	Mono	631.40	Metals
Fales Hot Springs	Mono	631.40	Metals
Little Hot Creek	Mono	603.10	Arsenic
Little Alkali Lake	Mono	603.10	Arsenic
Deep Springs Lake	Inyo	605.00	Salinity/TDS/Chlorides
Keough Hot Springs	Inyo	603.00	Metals
Amargosa River	Inyo/San Bernardino	609.00	Salinity/TDS/Chlorides

**Table 2. Summary of Compliance With Drinking Water Criteria for Nine "Naturally Impaired" Waters (from Use Attainability Analysis report).**

<b>Water Body Name</b>	<b>Sources of Drinking Water Policy TDS Threshold (3000 mg/L) Exceeded?</b>	<b>Parameters for Which Other Standards or Criteria are Exceeded</b>	<b>Water Quantity Considerations</b>
Wendel Hot Springs	No	TDS, specific conductance, arsenic, sulfate, fluoride, sodium	Flow in natural springs reduced due to nearby geothermal development.
Amedee Hot Springs	No	TDS, sulfate, fluoride, boron, sodium	Flow in natural springs reduced due to nearby geothermal development.
Fales Hot Springs	No	TDS, specific conductance, sulfate, fluoride, arsenic, copper, molybdenum, lead, aluminum	
Hot Creek	No	Specific conductance, fluoride, boron	
Little Hot Creek	No	Arsenic, beryllium, specific conductance, boron, lead, fluoride, antimony.	Annual flow ca. 1000 afa; evaporation increases salinity
Little Alkali Lake	Yes	TDS, Arsenic	Ephemeral
Keough Hot Springs	No	TDS	Flow 600 gallons per minute
Deep Springs Lake	Yes	TDS, specific conductance, pH	Ephemeral
Amargosa River	Yes (in Death Valley)	TDS, specific conductance, arsenic, sulfate, sodium, chloride, fluoride, boron.	Intermittent, variable annual flows



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**Information Sources**

California Regional Water Quality Control Board, Lahontan Region, 1995. *Water Quality Control Plan for the Lahontan Region*.

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California State Water Resources Control Board, 1988. Resolution 88-63, Sources of Drinking Water Policy.

U.S. Environmental Protection Agency, 1997. Establishing Site Specific Aquatic Life Criteria Equal to Natural Background. Memorandum dated November 5, 1997 from Tudor T. Davies, Director, Office of Science and Technology, USEPA Office of Water.